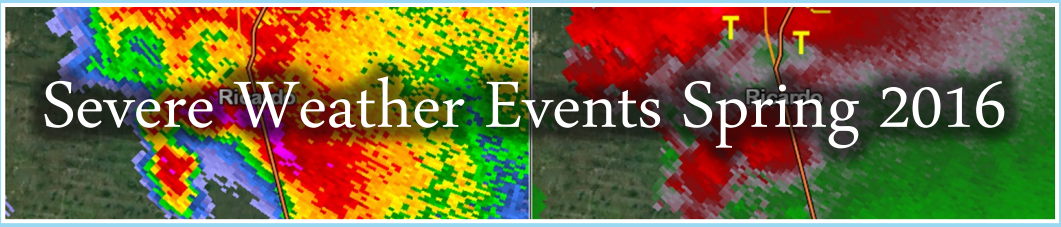
South Texas Weather Journal

NWS Corpus Christi, TX Summer 2016 Edition

Special points of interest:

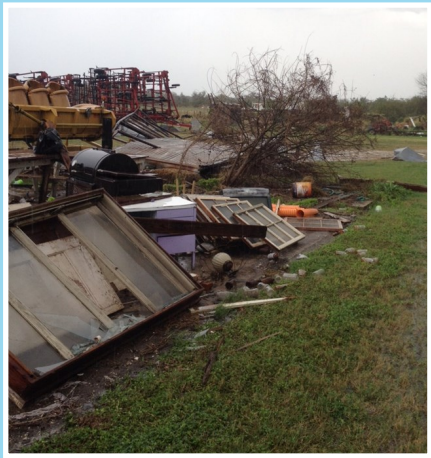
- Will South Texas experience a long–term drought again? Find out more!
- Ready for the summer to be over? Beat the heat with our safety tips!
- Learn more about our new forecasting tools, and improvements to the NOAA Weather Radio System.
- Come join us for our Open House, read in for more details!

Inside this issue:

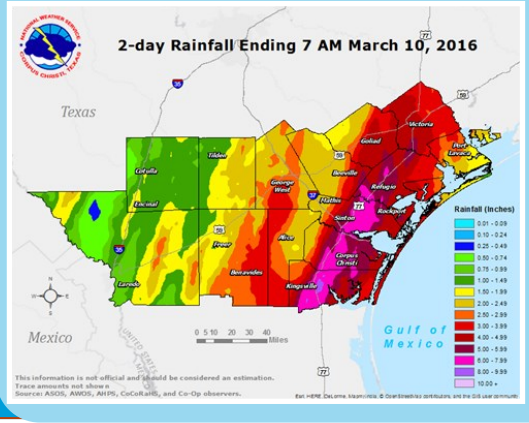


Severe Weather and Flooding Event – March 8-9, 2016

A very potent and slow moving upper level low along with plentiful moisture and a strong low level jet not only produced strong to severe thunderstorms, but also heavy rainfall and flooding over portions of South Texas during the late evening and early morning hours of March 8 and 9, 2016. Isolated severe thunderstorms with heavy rainfall began over the Mexican Plateau and impacted Webb County and southern portions of Duval County late on March 8. A customs border patrol agent estimated 60 mph winds in Webb County around 8:45 PM as the storms moved near the Laredo area. With the thunderstorm activity gradually weakening as it moved northeast overnight, no other severe weather was reported. However, more storms developed over the Rio Grande Valley south of Kingsville before sunrise on March 9, and became better organized and stronger as they moved north into the Coastal Bend. Severe thunderstorms began to impact the coastal counties of South Texas around 8 AM, with the storms producing damaging straight-line winds. An uprooted tree was reported in the community of Gregory, with damaging winds also reported in the cities of Victoria and Rockport. However, the community of Bonnie View in Refugio County suffered the most damage. A severe thunderstorm damaged a barn, with a rancher estimating 60 to 70 mph winds from the storm.



Severe thunderstorm wind damage at Bonnie View



Thus, along with the severe weather, persistent very heavy rainfall produced flash flooding over portions of the region. Locations receiving the most rainfall were the southern coastal counties, especially Kleberg, Nueces, and San Patricio Counties, where six or more inches of rain fell in 2 to 3 hours!

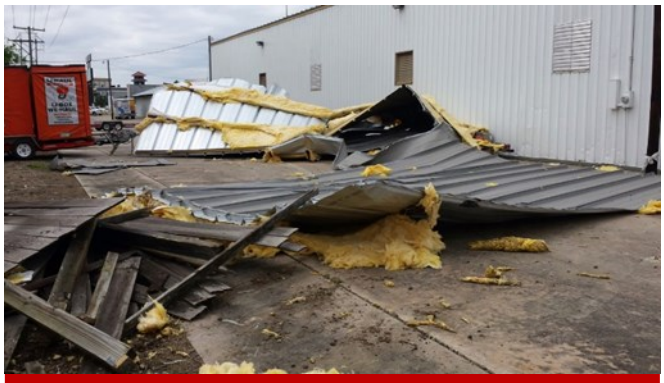
Severe Weather Event – March 18-19, 2016

Pile of large hail near Laredo

A slow-moving cold front combined with strong instability and plentiful moisture to initially produce isolated severe thunderstorms in and near the Laredo area during the early evening hours of March 18. Eventually, the storms became better organized and formed into a squall line mainly over the southern half of South Texas. Once they organized, the line intensified and moved rapidly toward the coast.

Some of the initial severe weather reports included: winds of 67 mph observed by a fire weather station about 5 miles northeast of Victoria, very large trees down near Artesia Wells in La Salle County, and a 150 foot Internet Tower collapsing on a house about 10 miles northeast of Goliad. However, the main show was the ever-progressive squall line. The line moved rapidly through the Southern Brush Country and Western Coastal Bend, producing winds estimated by Doppler radar between 69 to 98 mph over portions of Jim Wells and Duval Counties. The radar was showing a bow echo, a distinctive radar feature indicating strong, straight-line winds. Wind damage was reported in portions of Duval and Jim Wells County, as well as quarter-sized hail in Benavides.

The squall line moved through the western portions of Nueces and Kleberg Counties shortly after midnight. Winds in excess of 60 mph and wind damage was reported in the western portions of these counties, including downed power poles, roof damage, and 18-wheelers blown over on U. S. Highway 77. Wind gusts of 68 mph were measured at the Corpus Christi International Airport at 1242 AM. By the time the storms reached the South Side and downtown area of Corpus Christi, the radar was estimating a large area of strong winds between 69 and 92 mph! A wind gust of 78 mph was reported at NAS Corpus Christi! This intense line finally reached the coast around 1 AM, and then moved offshore, but continued to produce winds over the bays and the gulf waters anywhere between 40 mph to nearly 90 mph, the latter speeds recorded by offshore platforms.

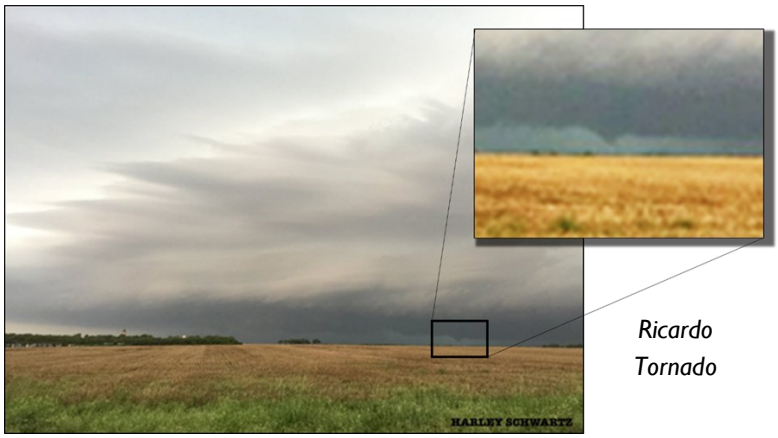


Corpus Christi severe thunderstorm wind damage

Flood Event – May 15-16, 2016

The Coastal Bend, specifically Kleberg, Nueces, San Patricio, Aransas, and Refugio counties, experienced a significant heavy rain event that began on the morning of May 15, 2016 and ended on the morning of May 16, 2016. As much as 10 to 15 inches of rainfall occurred during this timeframe across the south side of Corpus Christi, Flour Bluff, Ingleside, Aransas Pass, and Bayside! This amount of rainfall produced widespread flooding in these communities. Several hundred homes were flooded in Ingleside and Aransas Pass. Numerous roads and highways were closed due to the high water. Numerous water rescues occurred in San Patricio and Nueces counties. Many schools and businesses either delayed opening or remained closed. Elsewhere across the Coastal Bend, widespread 5 to 10 inches of rainfall fell.

Left: *Corpus Christi Water Garden.* ***Center:*** *Flooded truck at Flour Bluff.*
Right: *Aerial view of flooded streets in Aransas Pass.*



Ricardo Tornado

Kleberg County Tornadoes – May 31, 2016

An upper level disturbance moving across South Texas, combined with a very moist and unstable atmosphere produced strong to severe thunderstorms across South Texas on Tuesday, May 31. The strongest storms crossed Kleberg County and produced 3 tornadoes, very strong winds, large hail and torrential rainfall.

The first two tornadoes occurred nearly simultaneously as a supercell moving from the west merged with another cell from the south. One tornado occurred from roughly US-77 to Business US-77 just north of General Cavazos Blvd. This tornado damaged baseball fields near H M King High school and traveled westward to cause significant damage at the Casa Del Rey Apartments and homes along Otis Drive. A portion of a roof was blown off a home on Otis drive and numerous large trees and power poles were snapped. The second tornado occurred about a mile south, traveling west to east. This tornado first touched down near Dick Kleberg Park where bleachers were tossed 300 yards and the roof was blown off a metal building. This tornado tracked east and southeastward for 2.28 miles, snapping numerous trees and utility poles. A third tornado occurred 45 minutes later as these same cells continued to interact and move very slowly. While no damage was found from this tornado due to its inaccessible location, there are photos of this short-lived tornado southeast of Ricardo.

Left: *Tornado damage to Casa Del Rey Apartments.* ***Right:*** *Tornado roof damage to home on Otis Drive.*

A LOOK FORWARD

From El-Niño to La-Niña? Will South Texas Experience a Long-Term Drought Again?

Greg Wilk—Senior Forecaster

El-Niño conditions (above normal sea surface temperatures over the Equatorial Pacific) persisted over the Equatorial Pacific from the early part of 2015 through the first half of 2016. As of late June 2016, sea -surface temperatures in the El-Niño region have transitioned from being above normal to becoming slightly below normal. Model forecasts indicate that sea surface temperatures (SSTs) are likely to become even more below normal through the end of the year, resulting in La Niña conditions. Because of this transition, the El-Niño Advisory which was in effect since March 2015 has ended, and has been replaced by a La-Niña Watch. According to the Climate Prediction Center (CPC), La Niña is favored to develop during the August through October 2016 period, with a 55% to 60% chance of La Niña occurring during the fall and winter of 2016-2017.

During El-Niño events, South Texas will likely experience above normal rainfall and below normal temperatures, especially during the cool season (October through March). This certainly held true in 2015, as essentially all of South Texas experienced anywhere from 100% to more than 200% of normal rainfall (Figure 1). Also, most of South Texas saw above normal rainfall during the first half of 2016 (figure not shown), especially the southern and eastern portions of the region. However, some inland portions of the Northern Coastal Bend (primarily southern portions of Bee and Live Oak Counties and Northern San Patricio County) saw below normal rainfall for the first half of 2016, with isolated areas receiving only about one half their normal rainfall.

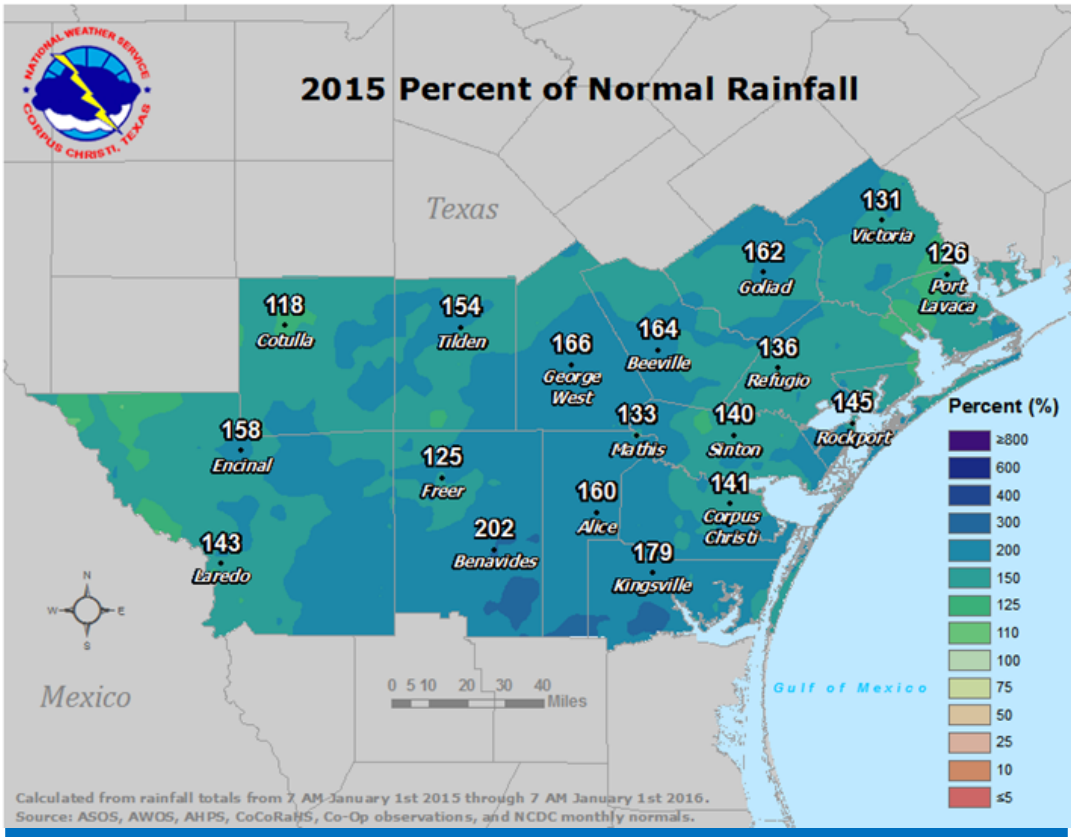


Figure 1: *Percent of normal rainfall for 2015. Essentially all of South Texas experienced above normal rainfall, as indicated by the more than 100% values across the region.*

Drier conditions began to return to all of South Texas during the last half of June, as El-Niño ended and more neutral conditions developed over the region. Some beneficial rainfall late in July over the northern and western portions of South Texas helped to alleviate some of the drier conditions over the last several weeks, but overall the weather pattern became warmer and drier. By the end of July, portions of Live Oak, Bee, San Patricio, and Western Webb Counties were experiencing moderate drought conditions.

During La Niña events, South Texas is usually drier and warmer than normal, especially during the cooler months (i.e., the opposite from El-Niño). So, given the potential for a La Niña event to develop, will South Texas experience a return to drought conditions? If La Niña develops by the end of 2016, then we will likely see below normal rainfall during the cooler months of October 2016 through March 2017. The long-range 3 month outlooks from CPC bear this out (see Figure 2), as most of the Southern U.S. (including Texas) will have a greater likelihood for below normal rainfall. If below normal rainfall persists over South Texas for several months, then drought conditions will not only expand, but increase in intensity. This would be bad news not only for farmers and ranchers, but also to many South Texas residents who may have to once again endure similar (if not more stringent) water restrictions in their localities. You can always keep track of the latest drought conditions over Texas by clicking on our Drought Page: http://www.srh.noaa.gov/crp/?n=drought The Drought Page will also provide you with information concerning drought impacts over South Texas (in the Drought Information Statement product), along with drought indices, long-range outlooks, and additional links for supplemental drought information.

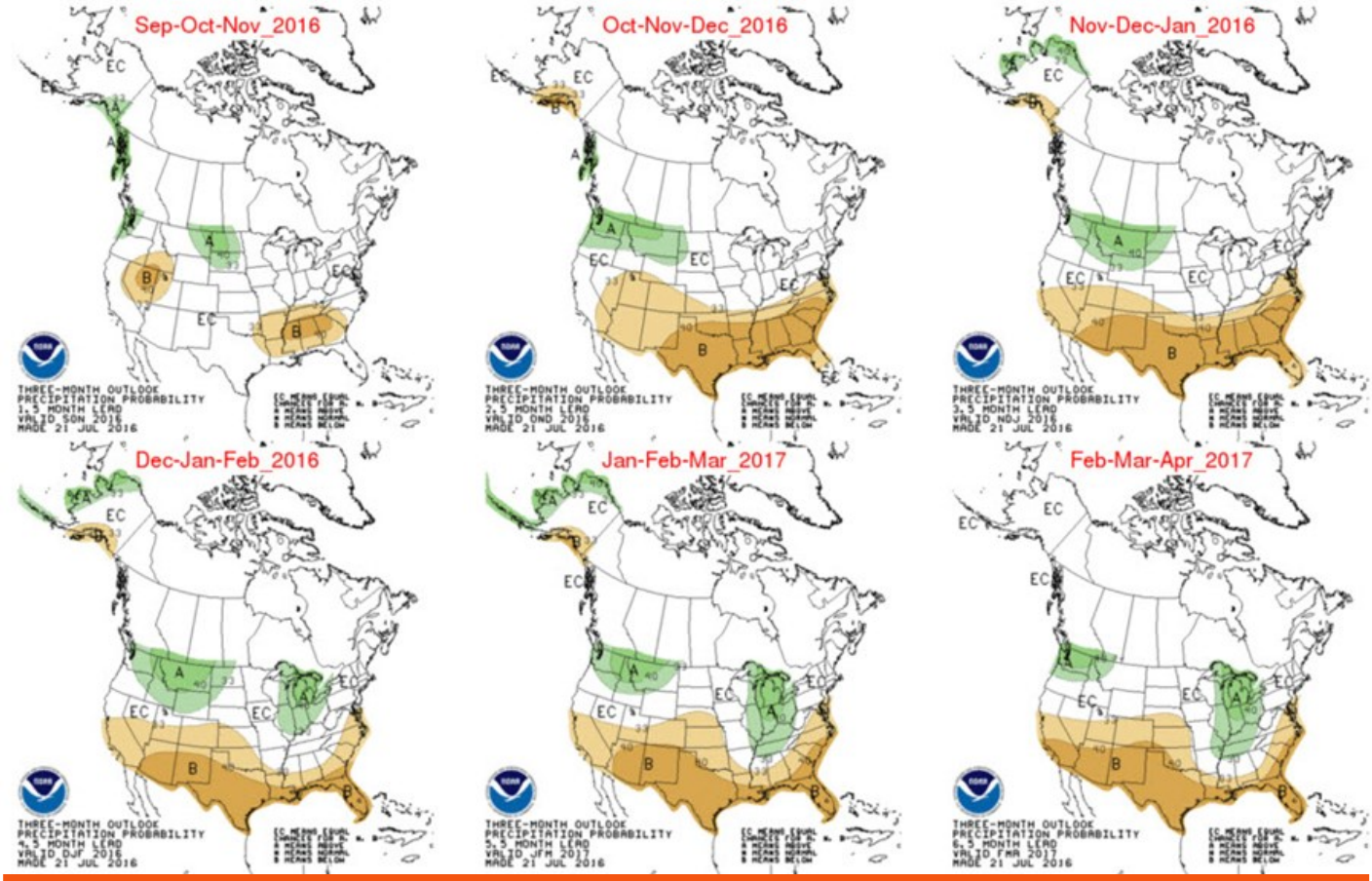


Figure 2: *Seasonal rainfall outlooks for the periods September-October-November 2016 through February-March-April 2017. The brown areas on the map indicate locations with a greater likelihood for below normal rainfall during the specific three month interval.*

Beat the Heat! Practice Heat Safety!

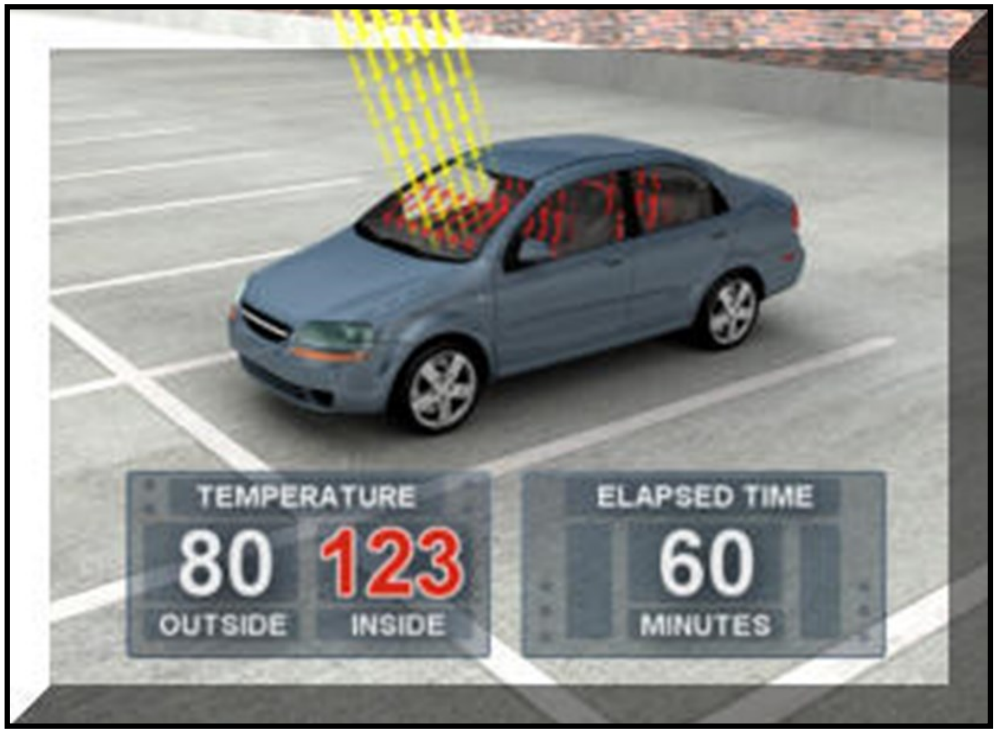
Tyler J. Castillo— Meteorologist Intern

Long stretches of very hot and humid conditions are not uncommon for South Texas during the summer months. Since the start of summer 2016 (June 21st), we have experienced the 6th warmest start to a summer dating back to 1887.

Rank	Average Temperature (°F)	Year
1	87.3	2009
2	86.9	1953
3	86.6	1998
4	86.5	1969
5	86.5	2013
6	86.0	2016
7	86.0	1980
8	85.9	2012
9	85.6	1978
10	85.3	1951

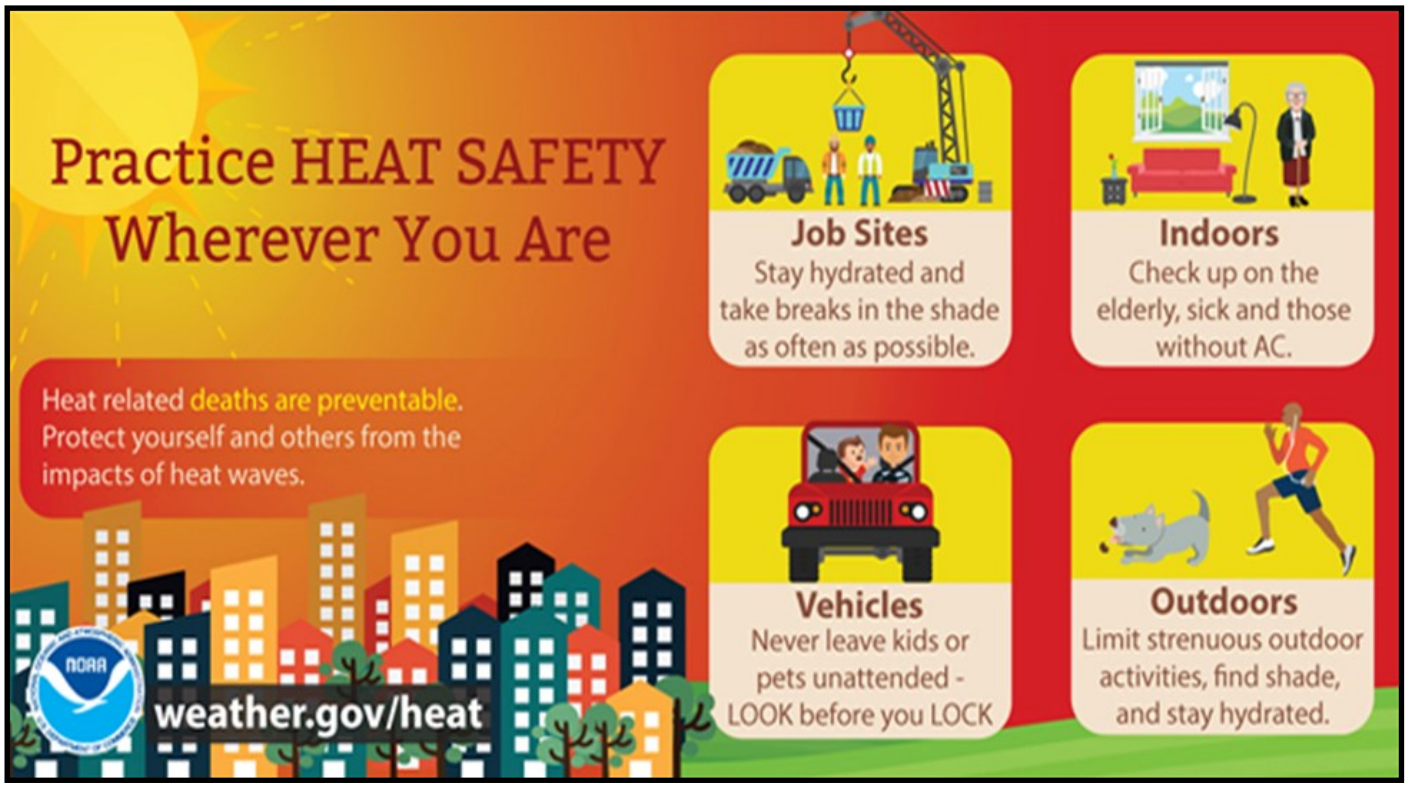
This excessive heat is a direct result of a high pressure ridge building into place for an extended period of time. Strong southeasterly flow is also allowing amble amounts of moisture from the Gulf of Mexico to be present across South Texas, therefore increasing the relative humidity. The high ambient temperatures and high relative humidity values have resulted in heat indices being over 100° on, almost, a daily basis.

Heat is one of the leading weather-related killers each year across the United States. Every year, there are hundreds of heat related deaths and many more heat related illness, such as heat cramps, heat exhaustion, heat stroke and hyperthermia, that affect people across the country that are not aware of the proper precautions they should take during long periods of excessive heat. Initial steps that can help you stay safe during these hot summer months are to limit your time spent outside, especially during the hottest part of the day. You should also drink plenty of water, preferably non-caffeinated and non -alcoholic beverages. Another step is to wear loose, lightweight and light colored clothing. Light colored clothing will help to reflect heat and sunlight, whereas dark colored clothes actually absorb the heat and will increase your body temperature. It is also a good idea to routinely check on any elderly neighbors as the elderly and small children are the most at risk to any heat related illnesses. You should also not direct the flow from portable fans towards yourself when the room temperature is greater than 90°, as the dry



blowing air will actually dehydrate you faster, thus endangering your health.

Children, the elderly, and pets should never be left in parked vehicles. Many studies have shown that temperatures inside a parked car can rapidly rise to dangerous levels. Below is an example of a car parked in direct sunlight on an 80° day. In just 60 minutes, the temperature inside the vehicle rose to **123°**! Just imagine how hot this car would get during a typical summer day in South Texas. It is always good practice to check your backseat, especially if you have children, before locking your car. Heat safety should always be taken seriously as it can affect anyone no matter how old you are. Be sure to check the local National Weather Service's forecast for your area and be up to date with potential temperature changes that may become deadly.



ADVANCEMENTS

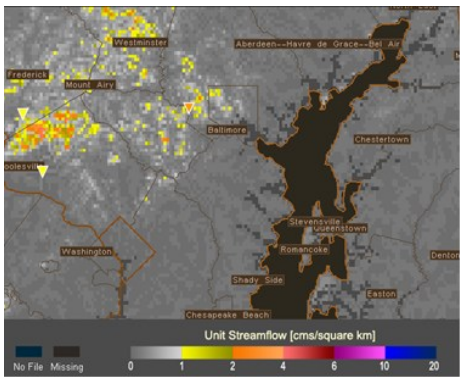
MRMS FLASH: How Forecasters Are Using This New Tool

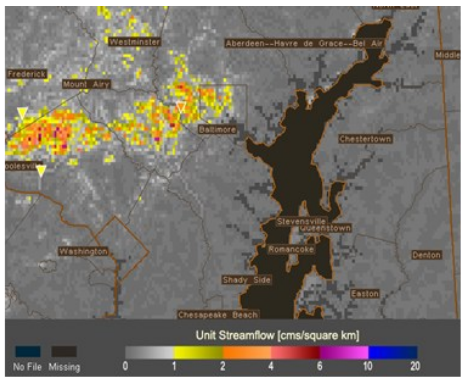
Greg Heavener—Senior Forecaster

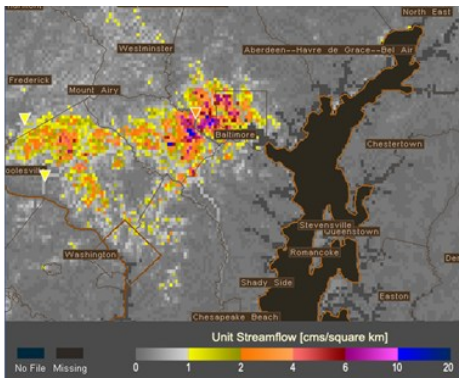
Multi-Radar Multi-Sensor Flooded Locations and Simulated Hydrographs, better known as MRMS FLASH, is a new tool used in National Weather Service forecast offices across the country. Originally developed by the fine folks at the National Severe Storms Laboratory (NSSL), the Cooperative Institute for Mesoscale Meteorological Studies (CIMMS), and the University of Oklahoma (OU) a few years ago. The past two summers operational forecasters have been invited to the NSSL hazardous weather testbed to utilize the FLASH data in real time and issue test flash flood warnings, mimicking what is normally done in the NWS forecast offices. I personally had the opportunity to test this data this past June and saw first -hand the value of this new dataset.

Whenever the NWS issues a warning, whether it's a severe thunderstorm warning, tornado warning, or a flash flood warning, we strive to give the public as much heads up on the expected impacts from these storms; otherwise known as lead time. Utilizing the MRMS FLASH data to better pinpoint areas of potential flash flooding when heavy rains begin also gives forecasters more confidence when going through their warning decision making process. Below is a quick summary of what each new product shows and how it can add to warning lead time.

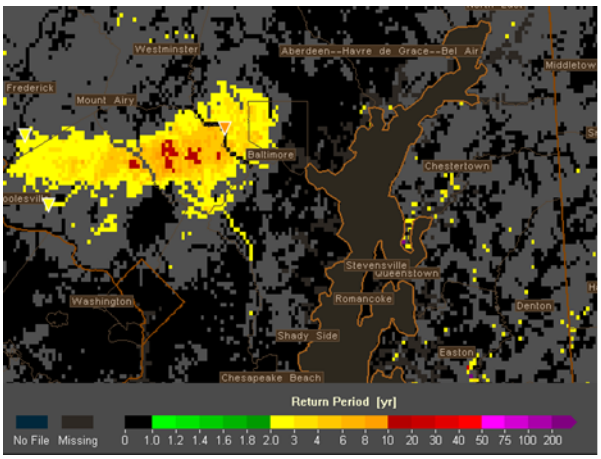
Unit Streamflow - Simulated water flows normalized by drainage area. Uses 2-min radar quantitative precipitation estimates (QPE) data and then simulates expected over-land flooding out to 6 hours. Has the potential to show areas of flooding well in advance of actual impacts. Example below is from the historic Ellicott City, MD flash flood event in late July 2016.

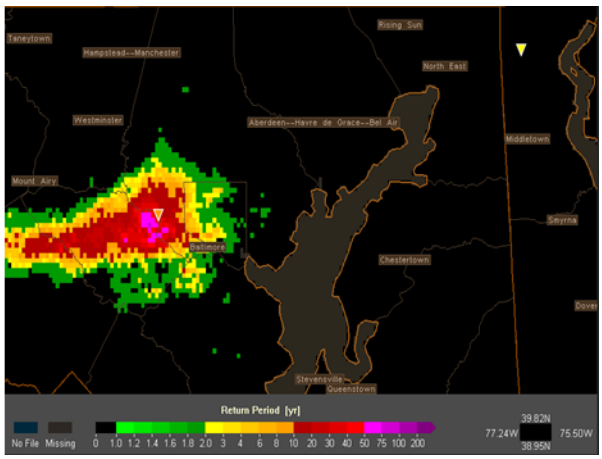




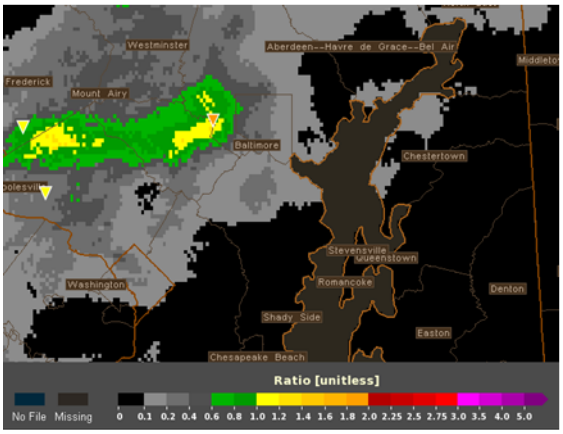


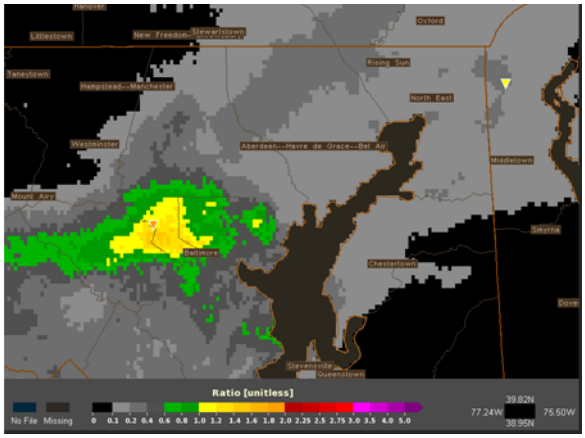
Precipitation Return Periods - Uses Atlas-14 data and other extreme precipitation datasets to show you return intervals for a given rainfall rate/estimated rainfall accumulation. The reds and pinks represent a once in a 50-200 year flash flood event. This is great product to use when deciding on how historic of an event is and whether a flash flood warning may need to be upgraded to a flash flood emergency. Example below is from the historic Ellicott City, MD flash flood event in late July 2016.





QPE to Flash Flood Guidance Ratio – Every forecast office in the country receives flash flood guidance (FFG) from their respective River Forecast Centers (RFC) on a daily basis. This information shows forecasters expected flash flood thresholds for 1, 3, and 6 hour rainfall durations over a particular area in inches. It takes into account terrain/topography and antecedent conditions, i.e. whether the ground is currently saturated or dry. This gives the forecasters an opportunity to see spatially how large of an area flash flooding may occur. Example below is from the historic Ellicott City, MD flash flood event in late July 2016.



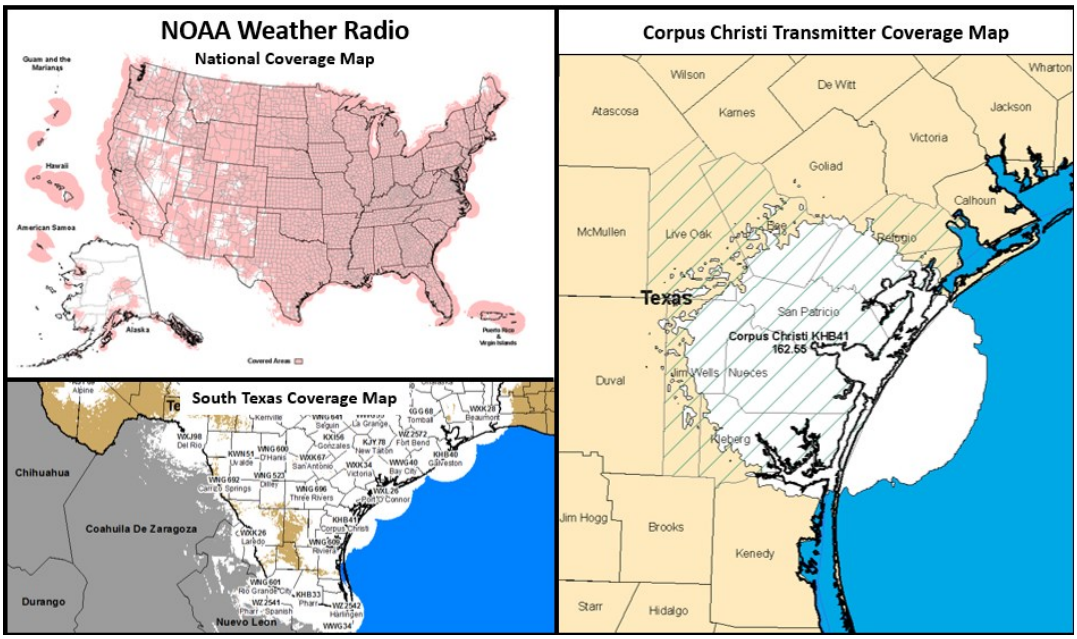


While all this new data is great to have, forecasters still have to rely on their local knowledge of the area and know the antecedent conditions. MRMS FLASH is another great tool to have in the bag when going through the warning decision making process.

ADVANCEMENTS

Corpus Christi NWR Transmitter Gets Upgrades

Lara Keys—Journeyman Forecaster



NOAA Weather Radio (NWR) broadcasts currently covers roughly 98% of the nation, sending out National Weather Service warnings, watches, forecasts, as well as other hazard and weather information. Transmitters across the country broadcast signals that can be heard on special NOAA Weather Radio receivers, which can be purchased from most electronic department and drug stores.

Our electronic technicians setting up the new Corpus Christi NWR transmitter.

Recently the transmitter at Corpus Christi, which broadcasts on a frequency of 162.550 MHz, was replaced with a new system. This new transmitter keeps the same functionality as the old system, but brings a much better sound quality and cleaner signal.

For those in the Corpus Christi and surrounding listening area, turn on your weather radio receiver and listen if you can hear a clearer broadcast along with the new voice of the Weather Radio! *(See further information about the new voice of the Weather Radio on page 11.)*

The Voice of the National Weather Service

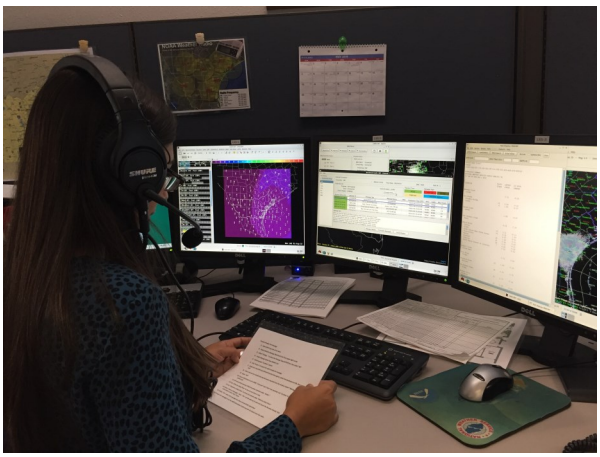
Lara Keys—Journeyman Forecaster


Broadcast equipment for KIH-20 Huntsville and KIH-57 Florence. Broadcast segments would be recorded on tapes, which were inserted into tape decks seen here.

The history of the National Weather Service's NOAA Weather Radio broadcast goes back several decades and has undergone many changes throughout the years. In the early 1960's the U.S. Weather Bureau began an experimental broadcast of marine weather products in New York and Chicago. This proving a success, the broadcasts grew further in content and expanded over the U.S. throughout the next decade. By 1971 the program was officially named NOAA Weather Radio (NWR) after the U.S. Weather Bureau was changed to the National Weather Service (NWS) under the National Oceanic and Atmospheric Association (NOAA). Well before modern text-to-speech systems were developed for the broadcast, local National Weather Service staff could be heard on-air, reading broadcast alerts, forecasts, and current weather and marine conditions. Weather alerts and information were recorded onto tapes and inserted into tape decks which would then play across local transmitters. By the late 1970's there were over 300 NWR stations across the country, with the program continuing to grow to over 800 station by the early 2000's and over 1000 stations across the 50 states and U.S. territories as of this year.

By the late 1990's a new method was implemented to speed up the dissemination of products to be broadcast with the Console Replacement System (CRS). CRS used a text-to-speech voice synthesis which would automatically convert all forecasts, warning, and weather information from a text product to a voice product that would be read over the radio automatically. This greatly spread up the process of producing and updating information, and allowed for multiple warnings to be transmitted over multiple transmitters at once. The first computerized voice named "Paul," was not well received, and subsequent updates were made to automated voices of Weather Radio, with "Craig," "Tom," "Donna," and "Javier," all used from the early 2000's until earlier this year.

Recently the NOAA Weather Radio has undergone another change within the weather forecast office operations, transitioning from the Console Replacement System to the Broadcast Message Handler (BMH). This new system comes with many internal updates to the NOAA Weather Radio broadcast system, streamlining the process of bringing the most current weather alerts and updates from the hands of Weather Service employees directly to the NWR and to listeners. However, the most apparent change listeners will now hear an updated voice, again dubbed "Paul," who can be heard speaking more in a far less robotic tenor. Although most broadcasts continue to be automated, National Weather Service staff does still have the capability to "go live" with broadcasts and read directly on-air, as well as record broadcasts to be played over the weather radio. A live voice is most often heard during such things as the Routine Weekly Test, a test conducted on Wednesdays between 11 AM and noon to ensure all radios are functioning properly, as well as during the Amber Alerts, and marine fishery announcements, reminiscent of the old days of Weather Radio.



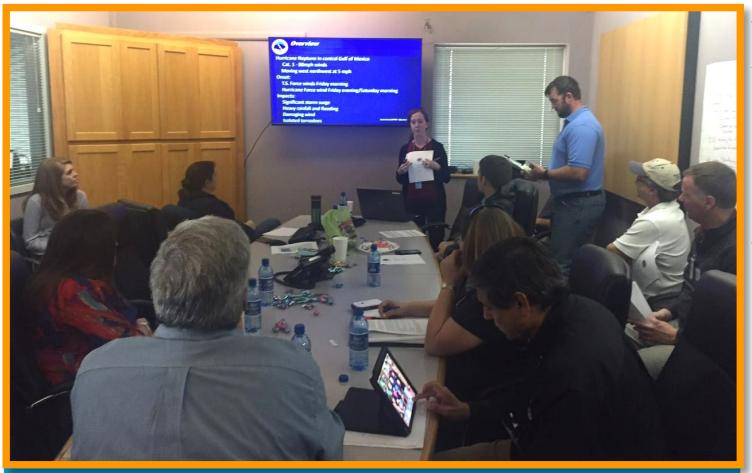
EVENTS & OUTREACH

Meteorologists Receive Decision Support Training

John Metz—Warning Coordination Meteorologist

When high impact weather events threaten South Texas, National Weather Service (NWS) meteorologists swing into action and provide our partners with weather information that will help them in making key decisions to protect life and property. These decision support services (DSS) help emergency managers and other local, state, and federal partners understand the type of impacts a particular weather event may have on the region and their operations. Information can be shared through a number of platforms, including text message, phone conversation, email briefing, or conference call webinar. For big events like a hurricane, our meteorologists can be embedded within the emergency operations center and provide direct support.

In order to expand our DSS skill sets our office held a two-day workshop and invited a group of expert facilitators from across the National Weather Service to Corpus Christi. Facilitators from the NWS Regional Operation Center in Ft Worth, West Gulf River Forecast Center, and Weather Forecast Offices in Houston and New Orleans shared their expertise with our meteorologists. This two-day training workshop focused on topics ranging from risk communication, to social media best practices, to effective graphics and briefings production. The event concluded with a half-day hurricane exercise in which our meteorologists put into practice what they learned. Several local media partners and emergency managers participated in the exercise, offering their expert advice as well. Local partners included Newscenter 25 in Victoria as well as emergency managers from the City of Corpus Christi and Nueces County.



Meteorologists Greg Heavener and Lara Keys participate in a mock hurricane briefing for the Corpus Christi Emergency Operations Center

We want to thank all those who made this event a great success. Our meteorologists are now better prepared to support our partners when the next high impact event threatens our community.

Preparing Communities for the 2016 Hurricane Season

John Metz—Warning Coordination Meteorologist

Meteorologist John Metz is about to present on Hurricane Preparedness at the Mid Coast Hurricane Conference in Victoria – April 21, 2016

Long before the start of each hurricane season, your local National Weather Service in Corpus Christi is working hard behind the scenes getting the community ready. Our staff provides hurricane training for local emergency managers and media partners, participates in hurricane exercises, and gives numerous presentations on hurricane readiness for local businesses, town hall meetings, and conferences. Our staff participates in two big hurricane conferences each year, including the Mid Coast Hurricane Conference which is held in Victoria in late April, and the Coastal Bend Hurricane Conference which is held in Robstown the first week of May. Combined, these conferences bring together over 1,000 local citizens, all with an interest in preparedness. This past April, we were fortunate to team up with experts from the National Hurricane Center and FEMA who traveled to Corpus Christi to teach the hurricane readiness course. On May 26, NWS Corpus Christi hosted a Hurricane Messaging Workshop for media partners and emergency managers at the Portland Community Center.

Forecasters from the National Hurricane Center visit NWS Corpus Christi for Hurricane Readiness Course. April 12-14, 2016

The message in this year's outreach focused on awareness of storm surge, the deadliest hazard, interpreting hurricane forecasts, and how to get ready for a storm.

Local emergency managers, first responders, and media partners pose along with Weather Service staff in support of being "Hurricane Strong" and prepared for the next storm.

Even though it's been over 46 years since a major hurricane graced the shores of the mid Texas Coast, your local NWS, in partnership with emergency managers and the media, are working to ensure our communities are ready when the next storm strikes.

STAFF SPOTLIGHT

New Meteorologist Intern Tyler J. Castillo

Tyler Castillo is one of the new Intern Meteorologists at WFO Corpus Christi. Tyler was born in Birmingham, AL and raised in Huntsville, AL. He always had an interest in the weather while growing up, but never realized he wanted to pursue meteorology as a career until he was a freshman at Birmingham-Southern College. He then transferred to Mississippi State University where he received a Bachelor's of Science in Professional Meteorology. After undergrad, Tyler then attended the University of Alabama in Huntsville where he received a Master's of Science in Atmospheric Science. Before joining the National Weather Service in Corpus Christi, Tyler volunteered at both the Huntsville and Birmingham, AL NWS offices and also worked as an Atmospheric Modeling Analyst for Kord Technologies in Huntsville, AL.

Outside of work, Tyler enjoys playing hockey, cycling, passionately following the Philadelphia Flyers and Jacksonville Jaguars, and spending time with his wife and 2 dogs.

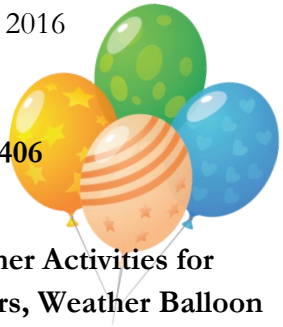
New Meteorologist Intern Kevin M. Wagner

Kevin Wagner is one of the new Intern Meteorologists at the National Weather Service (NWS) Weather Forecast Office (WFO) of Corpus Christi, TX. Kevin is originally from the Burbank, IL, a southwest suburb of Chicago, IL. His interest in weather began while in high school when he was caught off guard by a severe thunderstorm while fishing with his father. His fear of weather propelled him into pursuing a career in meteorology. From then on he began storm chasing and graduated with a Bachelor's of Science in Meteorology from Valparaiso University in Northwest Indiana. Kevin then went on and recently received a Master's degree in Atmospheric Sciences from South Dakota School of Mines and Technology. As a graduate student, he researched how supercell and squall line thunderstorms interact when they are in close proximity to each other. He was also a Student Volunteer with the NWS WFO of Rapid City, SD. Kevin is excited about starting his career in South Texas and is looking forward to gaining new experience in a sub-tropical climate.

Kevin has a special interest in severe weather, topographical influences on weather, winter weather (particularly lake effect snow), fire weather, and radar observations. Kevin is an avid fisherman and an all-around Chicago sports fan, minus the Cubs. He also enjoys being outdoors, hiking, tennis, racquetball, carpentry, and sculpting.

National Weather Service Corpus Christi Open House and 20th Anniversary Celebration!

When: Saturday, November 5, 2016
Time: 11 am—4 pm
Where: 426 Pinson Dr,
Corpus Christi, TX **78406**



Everyone is invited!

Come Join Us for Fun Weather Activities for Kids and Adults, Office Tours, Weather Balloon Releases, and Much More!

COOP Looking for an Observer

The Cooperative Observer Program (COOP) from the National Weather Service (NWS) is looking for a volunteer observer in Goliad, Texas. Some of the requirements to become an observer are:

- Dedication to public service
- Attention to details
- Ability to learn and perform daily duties
- Willingness to allow NWS to place measuring instruments on your property
- Willingness to allow at least one visit per year from a NWS representative.

For more information, please contact our office at **(361) 289-0959**.

DID YOU KNOW?

The **2011** drought was the most intense one year drought on record for the State of Texas. Over $8 billion dollars in agricultural losses were recorded across the state. Annual rainfall totals ranked all time driest for Laredo and Victoria dating back to 1898.

National Weather Service
WFO Corpus Christi, TX

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78406

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